MONTHLY WEATHER REVIEW,

MAY, 1874.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

I.—INTRODUCTORY.

This month has not been distinguished by any general storm of unusual severity, but numerous local thunder and hail-storms have been reported. The presence in the southeastern quarter of the United States of several large areas of high barometer has apparently produced a considerable rain-fall on the immediate Atlantic coast, with a decided deficiency in the interior of the country.

II.—BAROMETRIC PRESSURE.

(1.) *In General.*—The average distribution of atmospheric pressure for the month of May is shown on the accompanying chart, from which it appears that the region of highest barometer includes the South Atlantic and Gulf States, while the areas of lowest pressure are respectively in the Missouri Valley and the St. Lawrence Valley; the barometric pressure in Oregon is notably higher than in New England, a feature which accords with the general law that pressures average higher on the eastern than on the western borders of oceans.

(2.) *Areas of High Barometer.*—Nine well-marked areas of high barometer have been traced during the month, five of which appear to have passed, without losing their identity, from the Pacific coast southeastward to the Atlantic.

(3.) *Areas of Low Barometer.*—Eight areas of low barometer, forming the centres of considerable atmospheric disturbances, have passed over the region covered by our stations, and their central tracks are shown on Chart No. I. In general the paths of these storm-tracts lie considerably further north than do those of May, 1873; their courses being almost due eastward; while those of last year were more frequently northeastward.

No. I. The course of this depression is traced, in the review for April, backwards to the Pacific coast. It was, on the 1st of May, central in Nebraska, and quite steep barometric gradients extended from that region to the Upper Lakes and to the Gulf States. The storm-centre which had been moving with extreme slowness during several preceding days, apparently moved southward to the western plains until, on the morning of the 3d, it was central in eastern Kansas. A very extensive area of cold air and high barometer had meanwhile pressed southeastward over the Lake region to the Middle

Atlantic coast, the presence of which evidently materially modified the subsequent movements of the storm-centre. The latter moved in consequence almost due eastward, passing over Tennessee and Kentucky on the 4th, on which date the barometer at the centre was fully three-tenths of an inch higher than it had been on the previous day; but on passing over the Blue Ridge the central depression again increased, until it had passed over Cape Hatteras beyond our cognizance.

No. II. This depression is first indicated by reports from the extreme Northwest on the 6th, and on the 7th while it was still in the upper Missouri valley, a very extensive area of high barometer developed over the Gulf and South Atlantic States. On the morning of the 8th, a quite steep barometric gradient prevailed over the entire country from Texas and Michigan to Manitoba, and south or southwest gales prevailed from Colorado and Wyoming to Wisconsin and Illinois. The barometer continued to rise during the day throughout almost the entire Atlantic and Gulf coast States, while it fell rapidly over the entire country north of the Ohio and Missouri rivers. This unusual state of things continued during the 9th and 10th, and on the morning of the 11th, the barometric depression was still central in Minnesota and Dakota; during the subsequent day, however, it slowly moved eastward into Canada and was lost to further observation, having apparently been separated into at least two portions, one of which is No. III of the accompanying chart.

No. IV. This disturbance was first indicated by falling barometer and rain reported from Santa Fé on the 12th. The exact position of the area of greatest disturbance can scarcely be given until the morning of the 14th, at which time it was central in Kansas, whence it moved slowly eastward over Illinois on the 15th, Lake Erie on the 16th, and the St. Lawrence valley on the 17th. During the middle portion of its course the barometric gradients were very slight, but increased decidedly when the disturbance was in the Ohio valley.

No. V. The area of high barometer, that on the 17th covered the Southern States, gave rise to warm southerly winds, that encountering an area of cold air that pressed southeastward over the Upper Lake region, initiated a precipitation that gave rise to the depression numbered V, which may be considered in some sort as a remnant of No. IV. This area of low barometer passed slowly eastward over New England, and turning northeastward over Maine on the 19th, disappeared in the Gulf of St. Lawrence; it was accompanied by numerous light rains in the Middle and Eastern States.

No. VI. This depression probably passed over the Rocky Mountains on the 17th, and followed immediately in the train of an area of high pressure. Rain was reported from Minnesota on the afternoon of the 18th, and the lowest pressure was central in the southern portion of that State on the morning of the 19th. Its course continued slowly southeastward over Lake Erie on the morning of the 20th, and thence over New York on the 21st, and Maine on the 22d.

No. VII. An extensive area of high barometer separated the preceding storm-centre while it was in Maine, from No. VII, which, on the morning of the 22d, was in Dakota and Manitoba. In twenty-four hours this depression moved somewhat to the northeast, and on the 24th it developed rapidly as it moved over the Upper Lakes. On the morning of the 25th the depression was central over Lake Huron, and rain prevailed throughout the Middle and Eastern States. During the day this disturbance moved eastward

and northeastward, and was accompanied on its south and east sides by unusually numerous local thunder and hail-storms, of which a special report is in preparation.

No. VIII. This disturbance probably originated on the Plains west of the Mississippi, up which an easterly wind had, for several days, been blowing, in consequence of the high pressure then existing in the South Atlantic States. The greatest depression was on the morning of the 27th, in Dakota, on the afternoon of which date there were presented in that region, in a marked degree, a great contrast of cold north and hot south winds, the temperature ranging from 90 to 95 degrees from Lake Superior to Nebraska, with numerous local thunder-storms, while 57 degrees was reported from Pembina and Fort Garry. This conflict of north and south winds, with low barometer, continued for forty-eight hours, when an area of high barometer advanced southeastward toward Lake Superior, and on the 29th and 30th the original disturbance died away, and disappeared in Canada.

(4.) *Local Storms.*—By the term local storm will be included. in this section, every recorded case of thunder, lightning, or hail. The electrical phenomena attending these storms will be considered in a subsequent paragraph; but, so far as these storms are connected with the areas of low barometer, their distribution will be apparent from the following table of local storm frequency:

Regions reporting 1, 2, or 3 local storms during the month, at the Signal Service Stations:

Ohio Valley.
Middle Atlantic Coast.
New England.
New York.
Upper Lake region.
Upper Mississippi Valley.

Regions reporting from 4 to 8 local storms during the month, at the Signal Service Stations:

South Atlantic States.
Blue Ridge.
Tennessee.
Gulf States.
Missouri Valley.
Colorado.
New Mexico.

The most remarkable series of thunder and hail-storms is reported from Pike's Peak, where they have occurred on 12 different days, mostly during the last half of the month.

III.—ATMOSPHERIC TEMPERATURE.

(1.) *In General*—The general distribution of the temperature is apparent from the accompanying chart of isothermal lines and the table of comparative temperatures. For the entire Atlantic States a slight deficiency is reported, but in the interior of the country a decided excess.

(2.) *Frosts.*—No remarkably severe frosts have been reported during the month, but slight frosts have been quite frequent in the Northwest, the Ohio Valley, the Lower Lake region and New England. The most extensive frosts occurred on the 7th in North Carolina, Virginia, Pennsylvania, New York and Ohio; on the 18th in Illinois, Iowa, Michigan, Wisconsin, Indiana and Ohio; on the 19th in Ohio, Indiana, Virginia, North Carolina, New York and Maine; on the 23d in Pennsylvania, Virginia and New Jersey.